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A3V V1A5C V5Q V6E1
A4S S11
B7A AAJ

(56) Documents cited

GB 2232872 A	GB 2199233 A	GB 2133671 A
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GB 0557220 A	GB 0500270 A	WO79/00063 A1
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(58) Field of search

UK CL (Edition K) A3V, A4S
INT CL⁵ A47D, A47G, A62B

(54) Life support blanket or garment

(57) A flexible covering for an endangered person includes pockets for containing a heating medium. In one embodiment the covering comprises a blanket (11, Figs. 1 and 2), provided on one side with a liquid impermeable barrier (12) and with substantially parallel, elongate pockets (13) on the other side for containing the heating medium. Preferably the latter comprises heat generating crystals contained in sachets and of the type which generate heat when exposed to air. Such crystals may conveniently include compositions of water, chloride, cellulose, carbon and iron selected to produce, when exposed to air, a temperature of from 40% C to 60% C for between 6 and 8 hours. In another embodiment the covering is in the form of a two-piece suit with pockets for the heating medium and with rapid release fastenings (115, 116, 156, 157, 158, Figs. 3 and 4). The embodiment shown comprises a one-piece suit provided additionally with buoyancy panels 264, 265 and a buoyancy panel at the upper regions of the back. The suits comprise an outer liquid impermeable layer and an inner lining.

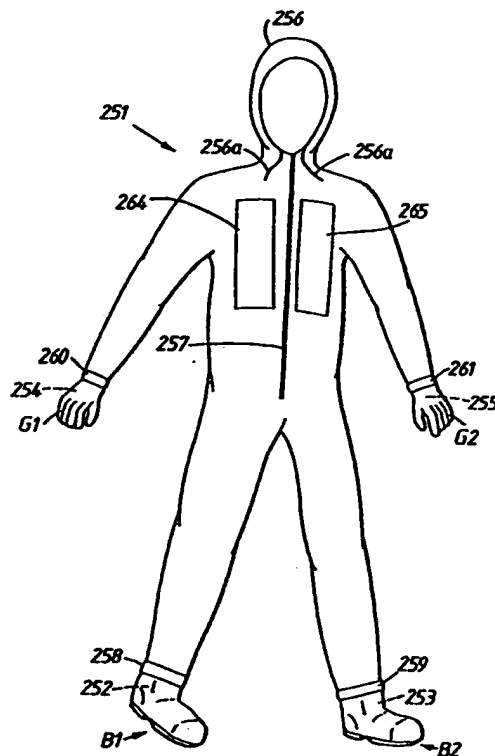


Fig.6.

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At least one drawing originally filed was informal and the print reproduced here is taken from a later filed formal copy.

The claims were filed later than the filing date within the period prescribed by Rule 25(1) of the Patents Rules 1990.

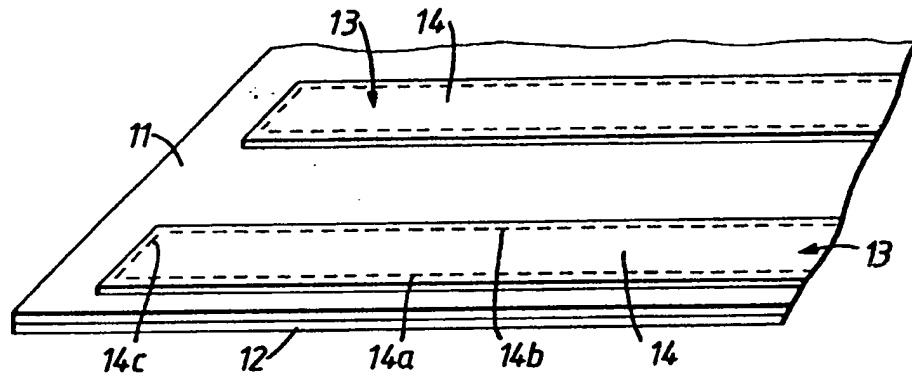


Fig. 1.

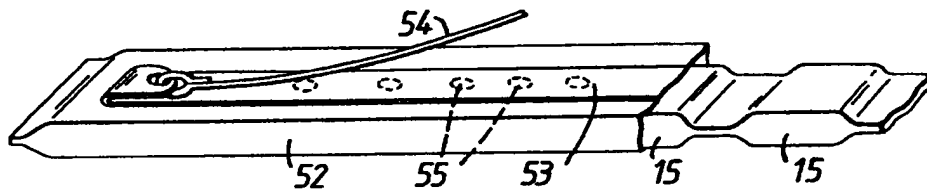


Fig. 2.

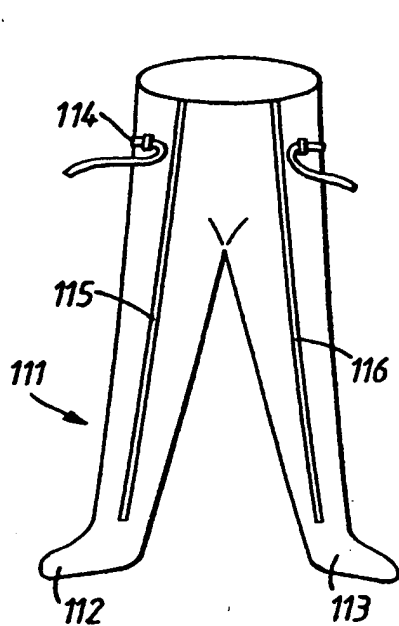


Fig. 3.

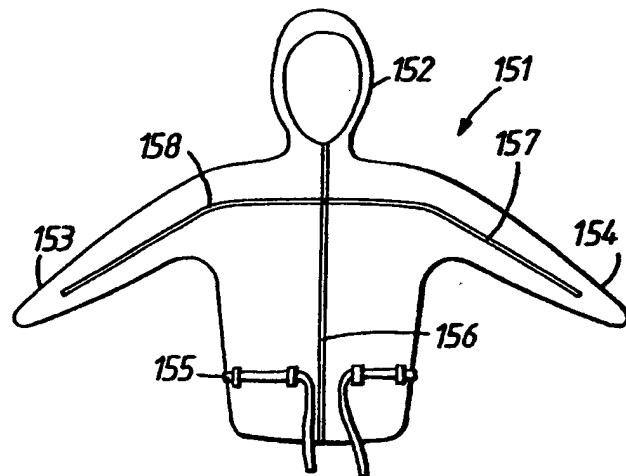


Fig. 4.

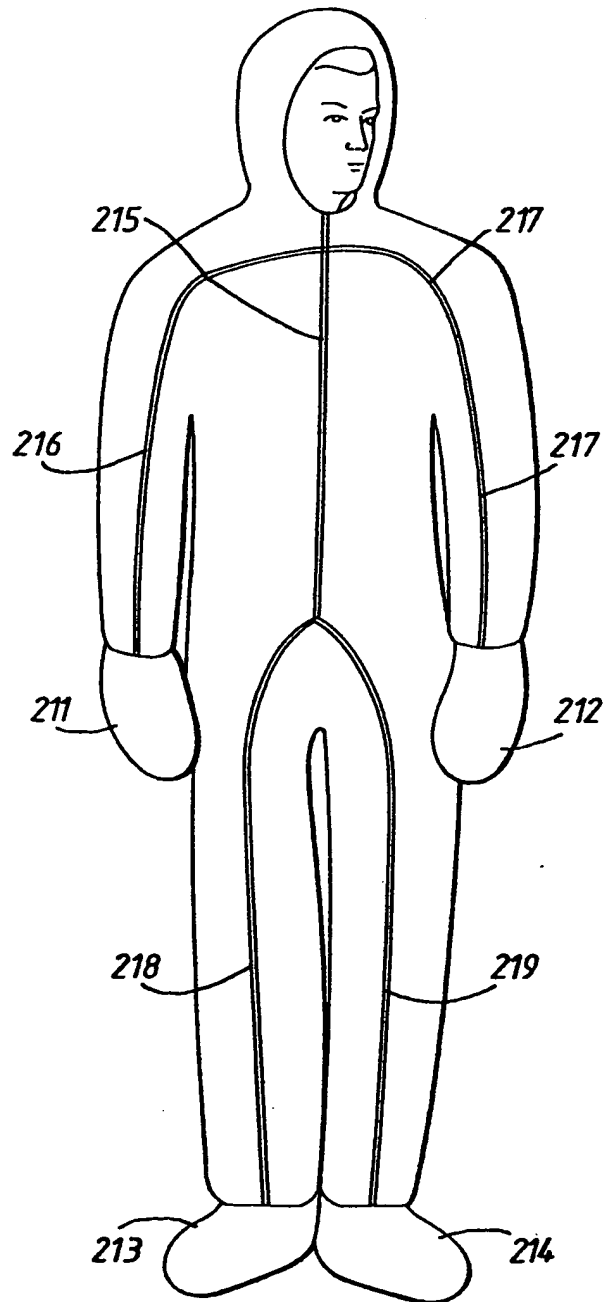


Fig.5.

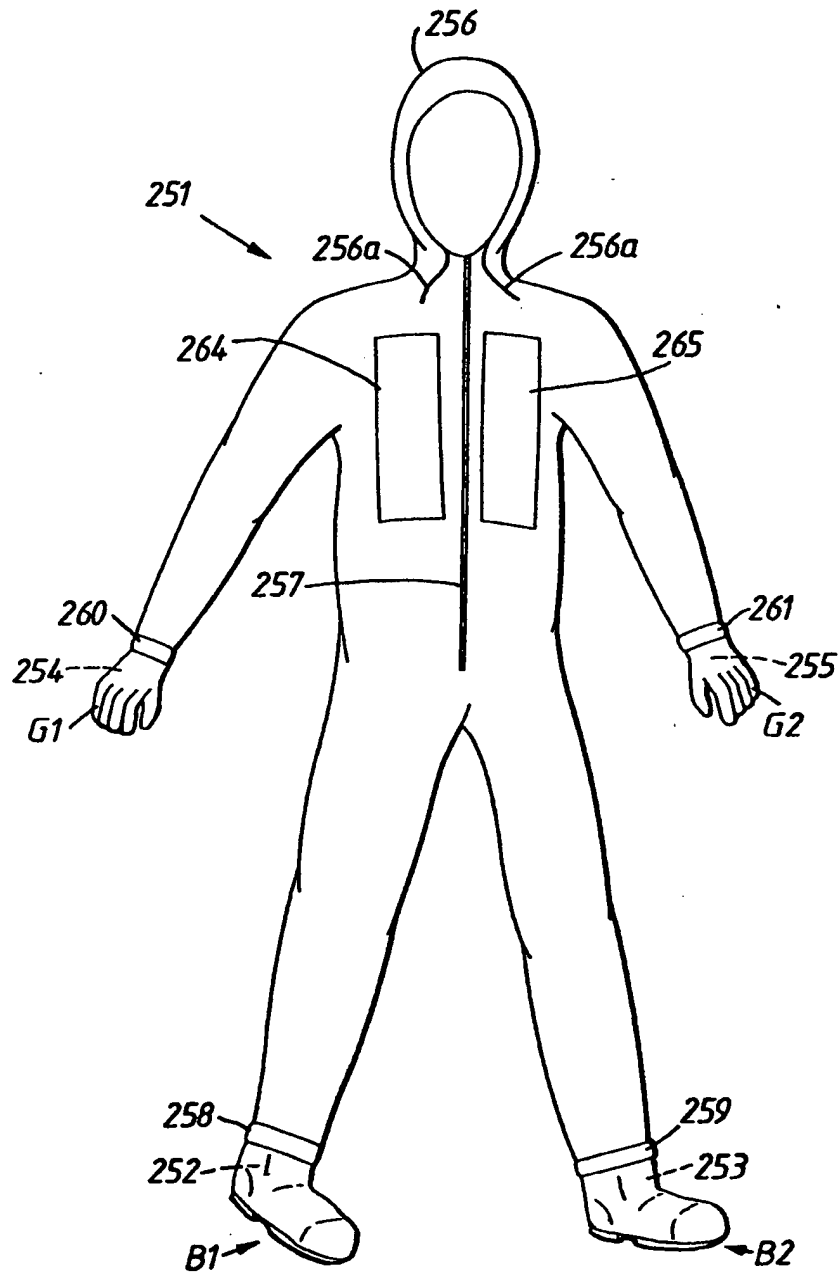


Fig.6.

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"IMPROVEMENTS IN OR RELATING TO LIFE SUPPORT AIDS"

This invention relates to life support aids and, more particularly, to life support aids for personnel who have to face, or have been rescued from, a shock experience and/or a cold environment and whose life may be threatened by exposure. Such a person is, hereinafter, referred to as an "endangered person".

It is the case that in many land and sea rescue operations the endangered person is suffering from shock and/or exposure and it is highly desirable in such cases that external heat be applied if death, or the loss of digits or limbs, is to be avoided. It is the standard practise when rescuing such an endangered person to wrap them in a blanket but, apart from lighting a fire, a mountain rescue team has no facilities for applying heat to the endangered person and, in

the case of a lifeboat rescue the crew has no means for applying heat to the endangered person.

Thus, for example on North Sea oil rigs, in winter conditions should a person fall into the water the lifeboat will be rapidly launched to collect the endangered person but the sea conditions are so cold that by the time that endangered person is brought into the rescue boat and returned to the rig for treatment that endangered person can die from shock and/or exposure before the rescue, on the return trip to the rig, during transport to the hospital facility or in the initial stages of being received at the hospital facility.

The present invention seeks to provide a life support aid which is portable, can be carried by one person and is capable of applying external heat to an endangered person.

According to the present invention there is provided a life support aid comprising a flexible covering for an endangered person including pockets for containing a heating medium.

In one embodiment in accordance with the invention life support aid comprise a blanket with spaced apart elongate pockets for containing the heating medium

In another embodiment the life support aid comprise a one-piece suit, with the said pockets located within the suit, said suit being arranged to totally cover the endangered person from the toes to the face.

In another embodiment the life support aid comprises a two-piece suit comprising a trouser garment, including foot parts, arranged to totally enclose an endangered person to a point above the waist, and a top garment intended to cover the upper part of the endangered person from a point below the waistband of the trousers, said top garment including arms with gloved hand, mitten or hand pocket attachments.

Preferably the life support aid, in blanket or

garment form, includes a liquid- impermeable barrier, in the form of a waxed cotton, "GORTEX" the trade name of water proof material well known in the art, or a metal foil, most preferably a flexible aluminum foil, sewn, bonded or otherwise secured to define the external facing for the life support aid.

Preferably the heating medium is stored in the life support aid and activated to generate heat at the location for use.

In one embodiment in accordance with the invention said heating medium comprises heat generating crystals of the type which generate heat when exposed to air. Such crystals are well known and one such known type of crystal comprises water, chloride, cellulose, carbon and iron.

Preferably the crystals for use with the present invention are selected to produce, when exposed to air, a temperature between 40° C and 60°C for between 6 and 8 hours.

Preferably the life support aid is stored in a vapour impermeable container.

The invention will now be described further by way of example with reference to the accompanying drawings in which;

Fig. 1 shows, in perspective view, part of a blanket-like life support aid in accordance with the invention;

Fig. 2 shows, in partial perspective view an insert for the blanket-like life support aid shown in Fig. 1;

Fig. 3 shows, diagrammatically, a trouser-type life support aid in accordance with the invention,

Fig. 4 shows, diagrammatically, a jacket-type life support aid in accordance with the invention,

Fig. 5 shows a life support aid in the form of a one-piece suit and,

Fig. 6 shows a one-piece suit for wear by a person intending to be exposed to a cold and/or exposed environment,

In the example illustrated in Fig. 1 a blanket 11 is provided with a liquid impermeable barrier layer 12 one side thereon and pockets, generally indicated by numeral 13, on the other side thereof.

The barrier layer 12 may conveniently comprise a woven fabric or layer, treated to be water impermeable, Gortex, or an aluminium foil, conveniently secured as by sewing or an adhesive to the blanket 11, and said barrier layer 12 is flexible to allow the blanket 11 to be readily folded for packaging and storage.

The pockets 13 are defined by panels 14 of a woven or felt material sewn to the blanket 11 along three peripheral edges, defined by longitudinal edges 14a, and 14b, and bottom edge 14c. Each pocket 13 is thus open at the unsewn edge (not shown).

The pockets 13 are arranged substantially parallel with the length direction of the blanket 11, in spaced apart relationship, and each pocket 13 extends for the greater part of the length of the blanket 11.

The panels 14 forming pockets 13 may be sewn to the blanket 11 prior to the attachment of the barrier layer 12 to the blanket 11, to maintain the barrier layer 12 impermeable to water.

The pockets 13 formed by the panels 14 contain

air permeable sachets 15 of crystals, said sachets 15 being formed from substantially continuous strip material with the sachets 15 of crystals spaced apart in the length direction of the strip.

In one embodiment in accordance with the invention the blanket 11, when loaded with its strips of sachets 15 of crystals, may be rolled up and contained in a gas impermeable container (not shown), such as a container of thermoplastics material, conveniently a flexible polythene, so that the crystals in the sachets 15 are protected from the surrounding atmosphere. At the point of use, the container is breached, the blanket 11 is opened, and laid flat with the barrier layer 12 lowermost and, with the blanket 11 opened, the crystals in the sachets 15 are exposed to air and immediately start to react to generate heat. The endangered person is lifted onto the blanket 11 and the blanket 11 is wrapped around the said endangered person.

The crystals contained in the sachets can contain any crystals capable of reacting with the oxygen in the atmosphere to produce heat and such crystals may comprise compositions including water, fluoride, cellulose, carbon and iron. Crystals containing the aforementioned materials and capable of generating heat when exposed to air are, as stated above, well known in the art but the composition of the said crystals is preferably selected to obtain a heat generating period of between 6 and 8 hours.

Thus, with the endangered person wrapped in the blanket 11 and the crystals in the sachets 15 generating heat the body of the endangered person will be warmed and the barrier layer 12 will protect the endangered person against rain, wind and the like adverse conditions.

Further, the barrier layer 12 constituting a backing to the blanket 11 will serve as an insulator to prevent heat loss therefrom.

Fig. 2 shows an alternative arrangement and wherein each strip of material, with sachets 51 in spaced

apart relationship, is contained within a vapour impermeable container 52, conveniently constructed from a thermoplastics sheet material, and which container 52 constitutes a vapour impermeable barrier to protect the crystals in the sachets 51 from the surrounding atmosphere.

The container 52 includes a tear-off strip 53 extending longitudinally thereof and, at that end intended to first enter a pocket 13 and thereby intended to lie adjacent the sewn bottom edge 14c, the end of the tear-off strip 53 is turned back and a lanyard or pull strip 54 is connected thereto and extends out of the pocket 13 to be accessible to an attending person.

Thus, the blanket 11 can be exposed to atmosphere until required for use and the crystals are activated by an attended person simply pulling the lanyard or pull strip 54 to rip-off the tear-off strip 52, to expose openings or apertures 55 through the container 52 and through which openings or apertures 55 air can pass to activate the crystals in the sachets 51.

In the embodiment illustrated in Fig. 3 the trouser-type life support aid is in the form of a trouser garment 111 with integral feet parts 112 and 113. The waist of the trouser garment 111 is generally identified by a belt or pull cord 114 and the trousers 111 extend upwardly therefrom to terminate just below the armpits of an adult.

The trouser garment 111 includes two quick-release devices 115 and 116, one to each leg, which may comprise zips or strips of velcro^(RTP) extending from the upper edge of the garment down a respective leg to the ankle.

On arrival at the location of use the two quick-release devices are opened down to the ankle level, the feet of the endangered person are thereby readily inserted into the foot parts 112, 113 and the quick-release devices 115 and 116 are closed from the ankle to the top of the garment 111. It will be seen that when the trouser garment 111 is fully fitted the whole of the endangered person from the top

of the trousers 111 downwardly is fully within the life support aid.

With the quick-release devices 115 and 116 secured the trouser garment 111 may be secured to the endangered person by the belt or tie 114.

The garment material may comprise any desired fabric but preferably comprises a liquid impermeable barrier layer, such as the barrier layer 12 referred to in the Fig 1 embodiment, and a lining material, conveniently a water absorbent fabric and which may be comprised of 50% polyester and 50% cotton.

The trouser garment 111 includes pockets (not shown) to contain one or more sachets of crystals, as described above, and intended to react with oxygen to generate heat. The pockets will be disposed at key locations within the trousers, including, for example, the soles of the foot parts 112, 113, the ankles, the knees, the crotch, the small of the back and the stomach parts covered by the garment.

Preferably the trouser garment 111 is normally contained in a vapour permeable container, such as a polythene bag, to protect the crystals from the surrounding atmosphere and, when the garment 111 is removed from the container at the location of use and whilst the trouser garment 111 is being fitted to the endangered person, the crystals are exposed to air and immediately react to generate heat so that, when the garment 111 has been fitted the heat generated by the crystals will warm the adjacent parts of the endangered person's body.

In the embodiment illustrated in Fig. 4 the life support aid is an anorak type garment 151 with a hood 152 and integral pockets 153 and 154 at the ends of the arms to receive the hands of the endangered person. The waist of the garment is defined by a belt or tie 155, and the garment 151 extends below the waist of an adult to afford the maximum of protection for the upper regions of the wearer.

The garment 151 includes a quick-release device

156, conveniently comprising a zip or cooperating strips of velcro^(R-TM) which extend from the lower edge to the neck at the front of the garment and two further quick-release devices 157 and 158, one to each arm, which extend from the quick-release device 156 across the chest and down the arms to the wrists of the garment 151.

Thus, to apply the garment 151, the quick-release device 156 is first unfastened, the quick release devices 157 and 158 are unfastened and the garment 151 is opened out, the endangered person is laid on the open garment 151, the endangered persons hands are fitted into the pockets 153, 154 at the ends of the arms, the quick-release devices 157 and 158 are then closed and the central quick-release device 156 is then closed to the neck so that the garment 151 totally encloses the torso and upper limbs of the endangered person. The hood 152 is fitted at any convenient time during the fitting of the garment 151 and is pulled well forward to a position affording maximum protection for the head of the wearer.

As with the the trouser garment 111 the anorak garment 151 will include pockets (not shown) for containing sachets of heat generating crystals, arranged to impart heat generated to desired locations such as the hands, the elbows, the arm pits, and other selected regions of the torso and the head of the wearer. Again, in like manner to the trouser garment 111, the upper garment 151 conveniently comprises a liquid-impermeable barrier layer with a lining material, to assist in protecting the endangered person from adverse weather conditions and to act as an insulator to prevent heat loss from the garment 151.

The upper garment 151 may be contained in a separate vapour permeable container to protect the crystals in the sachets from exposure to air and, at the site of use, when the container is breeched and the garment is opened to receive the endangered person, the crystals are exposed to the surrounding atmosphere and immediately react therewith to

generate heat.

Preferably a trouser garment 111 and an upper garment 151 are contained in a single vapour impermeable container, so that each container includes a complete suit for an endangered person.

the suit.

The life support aid illustrated in Fig. 5 comprises a one piece suit, intended to be used for a person suffering from shock or exposure.

The suit is made in one piece and includes hand pockets 211 and 212 formed integral with the arms of the suit and foot parts 213 and 214, also formed integral with the suit.

The suit includes a first quick-release device 215, comprising a zip or cooperating velcro^(RTM) strips, which extend from the neck of the suit down to a point just above the crotch, two quick release devices 216 and 217, again conveniently zips or cooperating strips of velcro^(RTM) which extend from the quick-release device 215 across the chest and down each arm of the suit to the wrist. Two quick-release devices 218-219, again comprising zips or cooperating strips of velcro^(RTM), extend from the lowermost regions of the quick-release device 215 down respective legs of the suit to the ankle part. Thus, the suit may be opened by unfastening the quick release devices 215, 216, 217, 218, and 219, and laid out substantially flat so that a person suffering from exposure can be laid onto the opened suit.

The feet of the exposed person are inserted into the foot pouches 213,214, respectively, the leg flaps are closed over from the ankle upwardly to allow the quick-release devices 218 and 219 to be fastened up towards the lower region of the quick-release device 215, the hands of the exposed person are inserted into the hand pouches 211, and 212 respectively and the arm parts are folded over to allow the quick release devices 216 and 217 to be connected, from the wrist upwardly towards the chest. With the person so enclosed

the hood can be drawn over the head and the quick-release device 215 connected, from the lower part to the upper part thus to totally enclose the person within the suit.

As with the previous embodiments the one-piece suit may conveniently comprise a liquid-impermeable barrier layer forming the exterior surface of the suit and an internal lining with pockets at desired locations within the suit for containing sachets of heat generating crystals.

As with the previous embodiment the one-piece suit may be stored in a vapour impermeable container until required for use and, in opening out the suit to receive an endangered person, the crystals are exposed to air and immediately start to generate heat so that with a person fully enclosed within the suit the heat generating crystals impart external heat to the desired parts of the persons body.

The suit illustrated in Fig 6 is intended for wear by a person intending to enter a cold environment, rather than be rescued, and comprises a one piece coverall 251 with integral foot parts 252 and 253, substantially identical with the foot parts 112 and 113 illustrated in Fig. 3, arm parts with integral hand pockets 254 and 255, in the form of gloves, a hood 256 , and a quick release device 257, preferably in the form of a zip or velcro^(RTM) fastening device, extending from the hood 256 to below waist level.

Hard-wearing boots or wellingtons B1 and B2, may be worn over the foot parts 252 and 253 and may conveniently connect to the trouser legs via velcro^(RTM) type fastenings 258 and 259 to prevent the entry of water thereinto. The wearer may also wear conventional type working gloves G1 and G2 respectively fitted over the hand gloves 254 and 255 respectively and which gloves G1 G2, conveniently connect to the arms of the suit, as by velcro strip, fasteners 260 and 261 respectively, to prevent the entry of water thereinto.

The suit essentially includes internal pockets, to contain sachets of crystals which may be exposed to the air, and thereby actuate generate of heat, before the person

dresses in the suit and the pockets containing the sachets of crystals will be dispersed throughout the garment to apply heat generated to the torso, arms, legs, feet and hands, and to the head, via a sachet in the hood.

The external gloves G1 and G2 and external footwear B1 and B2 may be applied to the suit before, but more conveniently after, the person dresses into the suit.

To dress into the suit the quick release device 257 is opened down to its lower position and the person can then climb into the suit, first inserting the legs into the trouser legs and the feet into the foot parts 252 and 253 of the suit and pulling the suit up, so that the below-waist part of the person is wholly within the suit, and then inserting the hands first into the arms of the suit and along the arms until the hands are wholly within the glove parts 254 and 255 within the suit. The quick-release device 217 can then be fastened up to the neck and the hood 256 drawn over the head and secured by tie strings 256a around the forward edge regions of the hood 256.

A person thus attired can then enter a cold or exposed environment and may work comfortably within the adverse environment for the six to eight hours life of the crystals, when the person must return to a protected environment.

When the person is to work in an environment where there is a danger of falling into water the suit includes two chest panels 264 and 265, which may be inflated or filled with a lightweight material. The suit will also include an integral pocket in the upper regions of the back of the wearer (not shown) and which again may be inflated and/or filled with a lightweight material. Thus, the panels 264, 265 and the back panel form buoyancy regions in the upper part of the suit, sufficient to support a person falling into water in like manner to a life jacket.

As with the garments described in the Figs 1, 2, 3, 4 and 5, embodiments the suit illustrated in Fig. 6 will

comprise a liquid-impermeable barrier layer with a lining material, said barrier layer serving to afford protection against wind and to serve as an insulator for retaining heat generated within the suit.

The barrier layer forming the exterior facing for the life support aid is preferably liquid-impermeable and, for most purposes, air-permeable so that air can seep through the said barrier to maintain the crystals activated and heat generating. However, in cases where the barrier layer is not air-permeable, as when the said barrier is a flexible metal foil, it may be necessary to occasionally open the life support aid to allow fresh air to flow to the crystals.

It will be appreciated that the sachets of crystals are readily inserted into the pockets of the life support aids proposed by the invention and are readily removed therefrom so that the sachets of spent crystals can be replaced by sachets of fresh crystals, should an endangered person be required to remain in the suit for a prolonged period or to simply prepare the life support aid for its next use.

CLAIMS

1.. A life support aid comprising a flexible covering for an endangered person, said covering including pockets for containing a heating medium.

2. A life support aid as claimed in claim 1, characterized in that said covering comprises a blanket with spaced apart elongate pockets for containing the heating medium

3. A life support aid as claimed in claim 1, characterized in that said covering comprises a one-piece suit, with the said pockets located within the suit, said suit being arranged to totally cover an endangered person from the toes to the face.

4. A life support aid as claimed in claim 1, characterized in that the said covering comprises a two-piece suit defined by a trouser garment, including foot parts, arranged to totally enclose an endangered person to a point above the waist, and a top garment intended to totally enclose the upper part of the endangered person from the neck to a point below the waistband of the trousers, said top garment including arms with gloved hand, mitten or hand pocket attachments.

5. A life support aid as claimed in any one of the preceding claims, characterized in that the said covering comprises an outer liquid-impermeable barrier.

6 A life support aid as claimed in claim 5, characterized in that said liquid-impermeable barrier comprises a waxed cotton.

7. A life support aid as claimed in claim 5, characterized in that said liquid-impermeable barrier comprises a metal foil.

8. A life support aid as claimed in any one of the preceding claims, characterized in that the said heating medium is stored in pockets in the covering and arranged to be activated, to generate heat, at the location for use.

9. A life support aid as claimed in any one of the preceding claims, characterized in that said heating medium comprises heat generating crystals of the type which generate heat when exposed to air.

10. A life support aid as claimed in claim 9, characterized in that said crystals comprises water, chloride, cellulose, carbon and iron.

11. A life support aid as claimed in claim 9 or 10, characterized in that the said crystals are selected to be of such composition as to produce, when exposed to air, a temperature of from 40% C to 60% C for between 6 and 8 hours.

12. A life support aid as claimed in any one of the preceding claims in combination with a vapour impermeable container, the said aid being stored in the said vapour impermeable container until required for use.

13 A life support aid, substantially as hereinbefore described with reference to and as illustrated in Figs 1 and 2, of the accompanying drawings.

14. A life support aid, substantially as hereinbefore described with reference to and as illustrated in Figs 3 and 4, of the accompanying drawings.

15 A life support aid, substantially as hereinbefore described with reference to and as illustrated in Figs 5 or Fig. 6 of the accompanying drawings.

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

9026759.2

Relevant Technical fields

(i) UK CI (Edition K) A3V;A45

(ii) Int CI (Edition 5) A47D;A47G; A62B

Search Examiner

D BUCKLEY

Date of Search

2 MARCH 1992

Databases (see over)

(i) UK Patent Office

(ii)

Documents considered relevant following a search in respect of claims

1 TO 15

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X, E	GB A 2232872 (COHEN) whole document	1 & 2 at least
X	GB A 2199233 (WORK WEAR CORP) see eg lines 3 to 11 of page 5	1 & 3 at least
X	GB A 2133671 (DRAGERWERK) see eg lines 119 to 128 of page 1	1,4, 5 & 8 at least
X	GB 1253784 (LITTON IND) whole document	1,3, & 5 at least
X	GB 760320 (GOURGUES) lines 3 to 26 of page 3	1,3 & 8 at least
X	GB 614393 (LAMBERGEON) especially lines 72 to 83 of page 2	1,3,5 & 8 at least
X	GB 557220 (SIEDLECKI) especially lines 16 to 21 of page 8	1,3,5 & 8 at least
X	GB 500270 (WEHNER) whole document	1 & 8 at least

Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

X: Document indicating lack of novelty or of inventive step.

Y: Document indicating lack of inventive step if combined with one or more other documents of the same category.

A: Document indicating technological background and/or state of the art.

P: Document published on or after the declared priority date but before the filing date of the present application.

E: Patent document published on or after, but with priority date earlier than, the filing date of the present application.

&: Member of the same patent family, corresponding document.

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).

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Patents Act 1977
Examiner's report to the Comptroller under
Section 17 (The Search Report)

Application number

9026759.2

Relevant Technical fields

(i) UK Cl (Edition) Contd. from page 1

(ii) Int Cl (Edition)

Search Examiner

D BUCKLEY

Databases (see over)

(i) UK Patent Office

(ii)

Date of Search

2 MARCH 1992

Documents considered relevant following a search in respect of claims

Category (see over)	Identity of document and relevant passages	Relevant to claim(s)
X	WO A1 79/00063 (ROWE) especially lines 21 of page 4 to 16 of page 6	1,2, & 5 at least
X	US 4839934 (ROJAS) see eg Claim 1	1 & 2 at least
X	US 4017921 (HERNANDEY) whole document	1 & 2 at least

SF2(p)

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Category	Identity of document and relevant passages	Relevant to claim(s)

Categories of documents

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&c: Member of the same patent family, corresponding document.

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